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Policy issues

Follow-up to and implementation of the outcomes of United Nations summits, in particular the United Nations Conference on Sustainable Development, and major intergovernmental meetings of relevance to the United Nations Environment Assembly

Status of the Global Environment Monitoring System Water Programme and pathways to the future

Note by the secretariat**

Summary

The present note, to which reference is made in the reports of the Executive Director on the implementation of Governing Council decision 27/2 (UNEP/EA.1/2/Add.1) and on the state of the environment (UNEP/EA.1/4 and Add.1), provides additional information on the Global Environment Monitoring System Water Programme (GEMS/Water). The outcome document of the United Nations Conference on Sustainable Development, "The future we want", emphasizes the urgent need to address water quality and water pollution and provides strategic direction on key actions needed to improve freshwater quality and monitoring. Among the proposals for the post-2015 development agenda, a number of water quality and water pollution issues feature prominently, in particular on wastewater and water-quality-related indicators, highlighting the importance of a global water quality programme such as GEMS/Water in providing the reliable water quality data and information needed for the effective management of water resources. GEMS/Water is currently undergoing an evaluation and inclusive redesign process taking account of a new United Nations Environment Programme partnership model presented at the meeting of GEMS/Water partners and donors held in Nairobi from 3 to 5 March 2014 and the GEMS/Water scoping meeting held in Stockholm in September 2013. Key partners and stakeholders have worked out modalities, outlined a rationale and carried out an initial mapping of individual partner preferences. The potential for enhancing GEMS/Water benefits and services for global, regional and country-based water quality assessment and policy information, including in providing evidence and knowledge products for the post-2015 process and the new Global Environment Outlook (GEO), have been explored. Significant opportunities emerged from the recent launch of UNEP Live as the central knowledge management platform based on open access to environmental information, synthesis and services. UNEP Live will provide freshwater quality assurance and quality-control assured-data and information in support of the GEO process.

* UNEP/EA.1/1.

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I. Purpose and objectives of GEMS/Water

1. Assessment processes constitute the fundamental building blocks that support UNEP's core mandate to keep the world environment situation under review. A successful water quality monitoring and assessment programme must be underpinned by credible science, institutional networks, partnerships and multi-stakeholder collaborative mechanisms, which provide a number of support functions, such as catalysing data flows, facilitating access to and sharing of environmental information. Collectively, these structures and functions support various levels of decision-making, from global to local and set priorities for technology support and capacity-building interventions.

2. Building on the Millennium Development Goals (MDGs) within the Post-2015 agenda, the ongoing development of a set of universally applicable Sustainable Development Goals (SDGs), includes a number of proposals with issues of water quality and pollution prominently featured.

3. Pathways for the future GEMS/Water will therefore be to enhance -and take a lead in environmental water quality assessments and the development of water quality indices relevant to policy decision making. The goal is to continuously provide the evidence base in the wider water quality context enabling informed sustainability transitions and sustainable development. Future products of GEMS/Water will be tailored to (a) improve data coverage, time series data, and enabling multiple scale assessments feeding into processes such as the GEO; (b) inform the post 2015 process towards, SDGs; (c) be an information pool for inclusive knowledge management in the context of sustainable water quality, use and development; (d) support water quality, quantity monitoring; and (e) assess water risks and vulnerability in light of global megatrends and climate change.

4. The role of GEMS/Water within and outside the UN system in monitoring and providing reliable water quality data and information needed for evidence based management of water resources are still and increasingly valued. The 26th UNEP Governing Council (GC) in February 2011 in its decision 26/14 encouraged Governments and other organizations to participate actively in the GEMS/Water Programme by contributing water quality data and information; and inviting Governments and others in a position to do so, including the private sector, to provide financial and in-kind support for GEMS/Water Programme capacity-building and transfer of technology efforts in developing countries. It also called for further development of the programme through creating a knowledge base for assessing water quality; promoting access to information; and strengthening capacity to enhance monitoring programmes and analytical assessment and research activities for integrated water resource management in developing countries; and encouraging cooperation at the regional level to enhance water monitoring at the global level. The progress made in the implementation of the decision was recognised and welcomed by the 27th UNEP GC/GMEF in February 2013.

II. Background

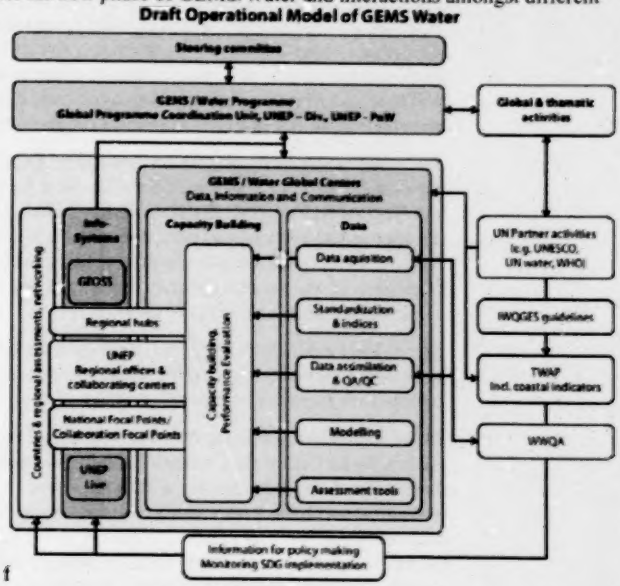
5. The GEMS/Water programme is a global programme of the United Nations on water quality whose activities are coordinated by the United Nations Environment Programme (UNEP). In mid 1970s, its activity centre was established in UNEP to coordinate various environmental monitoring programmes carried out globally particularly those within the United Nations System. It comprised five interrelated components and worked through the collaboration between UNEP and other specialised agencies, such as the World Health Organization (WHO), the World Meteorological Organization (WMO), and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Evolving from the pollution and water quality components, the Water Programme of GEMS is one of the two GEMS programmes that has been carried on till today and remained true to its original mandate in acquiring water quality data globally through the global water quality monitoring network. For the past decade, the GEMS/Water Programme has been supported by the Government of Canada, facilitated by Environment Canada and its Canada Centre for Inland Waters to build knowledge and capacity on inland water quality issues.

6. In response to critical issues such as increasing global water quality degradation, and decreasing sustainable aquatic services as identified by several UNEP assessments, an operational strategy for freshwater (2012-2016) was developed to provide a more concentrated and focused approach to freshwater based on its mandate and comparative advantage. The UNEP Water Operational Strategy 2012-2016 identifies four priority areas for action: (1) Meeting the water quality challenge; (2) Benefiting from aquatic ecosystems; (3) Building resilience to climate change through water management; and (4) Mainstreaming resource efficiency. The operational policy reflects on the importance of reversing water quality degradation in the world's freshwater ecosystems to ensure sustainable provision of ecosystem services and benefits. In implementing *Strategic Priority 1 Meeting the global water quality challenge* through its biennial programmes of work, UNEP has centrally

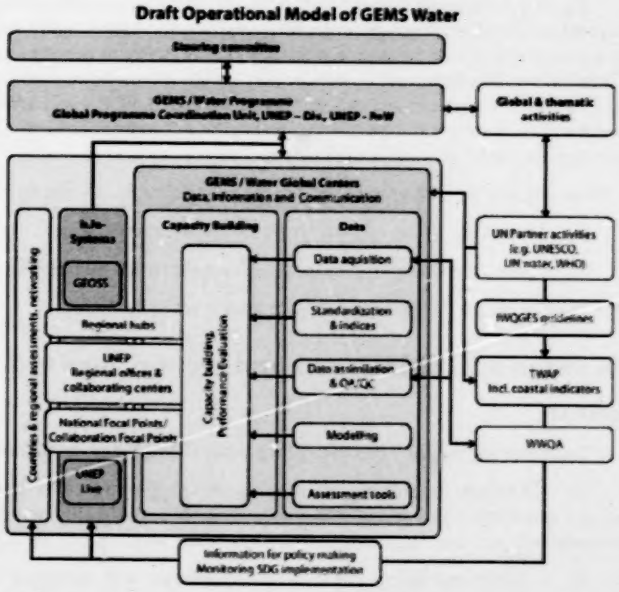
positioned the GEMS/Water *to provide technical support to countries in their efforts to improve and expand water quality (WQ) data collection and intensify global and regional assessments of the status of water quality in critical freshwater ecosystems and improve accessibility to reliable data through the global water quality data base.*

Transition phase and co-hosting arrangements

7. The proposed structure for the new phase of GEMS/Water and interactions amongst different components is illustrated in the f



8. w, where the roles of each element are outlined.



9. The Global Programme Coordination Unit (GPCU) will be based in UNEP's Division of Early Warning and Assessment in Nairobi with support and input from UNEP's interdivisional water group and the Steering Committee. Under the proposed arrangement, UNEP will strengthen the GPCU to provide a more effective coordination and management. It requires: (1) a Programme Management

Officer; (2) a Programme Officer in a supportive role; (3) two Junior Programme Officers engaged from partner governments whenever the opportunity arises; (4) the Fund Management Office (FMO) with one officer designated to support the programme and one general support staff. Services to inform policy making and coordinating direction are part of the responsibilities of the GPCU. Through representation by senior UNEP management it shall provide support to the United Nations Environment Assembly (UNEA).

10. The Steering Committee (SC) will be chaired by the Director of UNEP's Division of Early Warning and Assessment. It will provide guidance to the GPCU on how best to synergise with other similar and complementary programmes/activities, and assist in soliciting wide support for the implementation as well as partnerships in order to build stronger networks of collaborators. The SC will agree on its own operational arrangements, e.g. modes of communication, frequency of consultation, selection of new members if necessary, etc.

11. GEMStat Unit and Quality Assurance/ Quality Control (QA/QC): Under an Agreement between UNEP, The German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through the German Federal Institute for Hydrology (FIH) shall provide the appropriate professional personnel, technical facilities and their maintenance and technical support. As part of its efforts towards ensuring credible water quality data from laboratories in developing countries – it will support capacity building activities including conducting of performance evaluation studies in collaboration with the GPCU.

12. The GEMS/Water Programme will be supported by a global network comprised of regional hubs, National Focal Points (NFPs) and Collaborating Focal Points (CFPs). A set of collaborating centres with expertise in particular areas will complement the new network structure.

13. Under partnership agreements currently being developed between Ireland and UNEP, a new GEMS/Water Centre for Capacity Building is foreseen at University College Cork in Ireland to lead the capacity building activities with support from a consortium of Irish universities and institutions. It will partner with the FIH in Germany as co-hosts of the new GEMS/Water Programme and engage with regional and other partners of the GEMS as appropriate. The Capacity building element of the GEMS/Water Programme will build knowledge and skills for monitoring and analysing of Water Quality (WQ) parameters at national, regional and global level and also institutional level. If sufficient resources are applied to this component, the GEMS/Water member countries should eventually reach the same standard in analysis.

14. The WQ assessment element will make use of WQ data at the GEMStat database to contribute to targeted assessments. Through projects like the World Water Quality Assessment (WWQA), the programme is also able to re-engage with its NFPs and CFPs to generate more and updated WQ data and information. It will provide an opportunity for the programme to work closely with the UN-Water Group, its partners, regional and national institutes. On country level and based on an open data policy foreseen in UNEP Live it is expected that countries will enable access to a broader and more comprehensive scope of water quality information.

15. Initially, the new Programme will in the near future be advised by two expert groups:

(a) Working Group on Data (to be led by Germany);

(b) Working Group on Capacity-building (to be led by Ireland).

The terms of reference for both working groups are yet to be defined.

III. New vision of GEMS/Water and the way forward

A. Objectives

16. The following are the objectives of the new GEMS/Water programme:

(a) The new programme will mobilise and support the collection, generation, analysis, open access and more sharing of special and a wide range of water quality parameters that are QA/QC-assured and will increase the visibility of GEMS Water and improve the dissemination of its products;.

(b) At regional and global level, the programme will participate in and assist in regular assessments of the status and trends of freshwater quality; and increase regular data submission from member countries as part of national contributions to UNEP Live and fill the gaps in terms of spatial coverage, parameters measured, time variability and consistency;

(c) The programme will increase networking at different levels from global to national and enhance the capacity of developing countries in water quality monitoring and analysis and data input in the GEMStat database and advance program coordination and implementation.

B. Functions

17. The new GEMS/Water programme will adopt a more integrated approach in upwelling data and information to support assessment processes and inform decision-making. The main functions of the new programme are summarized below.

18. **Use of the UNEP Live platform and other information dissemination media**: The mechanisms will be used to provide freshwater quality-QA/QC assured data and information in support of assessments, policy and decision making and other water-related initiatives within the UN system and produce relevant value added policy products.

19. **Support to sustainable development goals on water quality**: The GEMS/Water programme through the UN-Water[1] mechanism can play a key role in supporting the SDGs development and monitoring processes. Surface and ground water quality data is a valuable asset of the GEMS/Water programme. Large amounts of data have been collected in the past 35 years from approximately 4,600 monitoring stations from over 125 countries. There are in excess of 4.6 million data values stored in the GEMS water database, the *GEMStat*. These range from 1965 to 2013, depending on region/country. If continuously further developed and addressing the still considerable data gaps these time-series data can support the SDG process in establishing the baseline for selected indicators and providing the evidence base for tracking the progress made towards the targets. Disaggregated data in the database is also useful for assessments and important to the development of indicators and statistical analyses. However, although GEMS/Water has been working through an extensive network of national monitoring programmes and collaborating institutions to upwell data from countries and regions, considerable gaps still exist in temporal, geographical and parameter coverage. It is expected that working through UNEP Live and the UNEP Regional Offices will provide new avenues for mobilizing country data in a broader and continued coverage.

20. **Support to the UN-Water Group, Water Quality assessments and management activities**: Through UNEP's membership in the UN-Water Group, the GEMS/Water programme is well placed to support the UN-Water Group in its coordinated contribution to the processes leading to 2015 and beyond. The work of GEMS/Water on water quality indices and assessments could serve as a starting point for the establishment of a harmonized and coherent global monitoring system and a regular assessment process such as the World Water Quality Assessment Report providing information for water resource management at the national, regional as well as the global level.

21. **Increased WQ data for indicator development – working with UNEP Live and Regional Offices**: The UN system task team Working Group on Monitoring and Indicators when presenting the lessons learned from experience with MDGs monitoring framework, and making recommendations for the formulation and monitoring of new indicators and targets, stressed that it is important to invest in country capacities for data collection and reporting, leading to progress in disaggregation as well as towards the development of new indicators. UNEP Live (www.unep.org/uneplive) will work with countries and key partners within and outside the UN to build capacity, as a neutral broker encouraging access to data and information and to develop global regional and national perspectives. During Phase 1 of the platform, countries will have the opportunity to store, publish and decide on which data to make available through UNEP Live. This will be pilot-tested with 3-4 countries. During this phase, UNEP will contact all countries, through UNEP's regional offices, so that relevant and up-to-date information and data can be made available on the platform. This will enhance the capacity for data collection and analysis to support indicator based assessments at national and international levels. GEMS / Water (namely through GEMStat) and the World Water Quality Assessment (WWQA) Project will be requested to explore both best possible data coverage on country scale in the pilots as well as a first global coverage of 2-3 commonly agreed key parameters.

22. **Integration with transboundary initiatives**: As a direct link to GEMS and also working with UNEP Live the Global Environment Facility Transboundary Water Assessment Programme (GEF TWAP) provides five independent indicator-based assessments three of which directly referring to fresh water and to some extent the interfaces between them, including their socioeconomic and governance-related features. Their input data and indicators are being assessed and organized and will be presented in a common data portal linking five individual water system databases that contain more

[1] UN-Water is the United Nations interagency coordination mechanism for all matters related to freshwater, including surface and groundwater resources, as well as sanitation within the United Nations System and with non-UN partners.

detailed data and information (www.geftwap.org). TWAP results are aimed at informing policy-making and funding priorities, as well as to document the status of, and monitoring the trends in transboundary water systems, in response to national, regional and international management.

C. GEMS/Water Programme: key challenges

23. **Inadequate and single donor financial support**: The working model used during the past 35 years has relied almost entirely on the technical capability and support from a single donor, which on the one hand provided solid and generous support and at the same time has put some restriction on the human and financial resources of GEMS /Water.

24. **Diminishing programme's visibility**: Challenges in establishing itself as an authoritative voice in environmental water quality assessment within the UN system is linked to a need for a strong global leadership and adequate long term levels of financial support and continued data flows.

25. **Existing data coverage, consistency, and a range of critical gaps in some regions**: Thus currently available data is not always representative to provide a comprehensive global overview of the water quality status.

26. **Perceived lack of tangible benefits to members**: Data submitted to the GEMStat is sometimes perceived not to provide immediate benefits to members i.e. data providers. It will be pivotal to work with countries and build capacity and analytical skills also relying on UNEP Live to enable multi scale and issue driven assessment and analysis on country, system and institutional level.

27. Lifting GEMS / Water to a central role in the SDG process**: i.e. to be seen as the leading mechanism and enabling broker assisting in indicator focused monitoring of water quality and providing evidence for countries to scan the SDG targets in the Post 2015 process**.

28. **Keeping track on future data developments**: such as big data (remote sensing information as part of e.g. the Copernicus program) and exploring avenues to bring/link water quantity information and ultimately also link coastal and estuarine water quality.

D. Transitioning the GEMS/Water Programme and options for sustainable solutions

29. **GEMS/Water Programme transition**: The termination of the generous Environment Canada funding for GEMS/Water at the end of the current agreement, March 31st 2014 and the preparedness of a new host (BMUB through engaging FIH in Germany to host GEMStat) presents an opportunity, with Ireland, as co-host namely focusing on capacity building. The goal is to rethink the role and structure of GEMS / Water including to identify new ways towards strong global leadership and multiple donor input to global water quality assessment. It is critical to establish a collective process of technical structural and funding discussions with partners and stakeholders to build on past accomplishments and experiences in developing a new sustainable GEMS/Water programme. Several evaluations of the GEMS/Water Programme since 2002 by Environment Canada and UNEP suggested possible future options, business and governance models for the Programme. The information provided in these evaluations and reviews, plus suggestions and recommendations emanating from consultations with water quality experts and colleagues in the water quality field, serve as the basis for proposing a draft future business and governance model for GEMS/Water based on a strong global leadership and a multiple donor support. Critical issues facing the programme are to be taken into consideration together with emerging water quality challenges. There is need to look at existing and emerging opportunities and capitalise on these namely working closely with and relying on the support by UNEP Live and the countries to be engaged through UNEP Regional Offices.

30. **GEMS/Water Programme: capitalising on opportunities**: There are opportunities that may have a significant bearing on how the proposed programme is designed. These opportunities are described and grouped as follows (albeit not exclusively).

Creating strong partnerships and technical support

31. A business model with strong global leadership and a support base of many partners and donors with long term funding is needed. This provides an opportunity for potential new donors and or technical partners to get involved in GEMS/Water programme based on their specific areas of interests and technical expertise. A broad based financial support at regional level with the engagement of regional hubs in resource mobilisation, targeted towards appropriate water quality assessment and capacity building projects is desirable. All these aspects have been successfully addressed in a first partnership and donors meeting held at UNEP headquarters 3-5 March 2014 back to back with the World Water Quality Assessment and the International Water Quality Guidelines for Ecosystems

project. This underlines that UNEP aims to make the development of the new business model a collective and inclusive effort together with partners.

32. There is a need to establish a stronger relationship with water quality institutions and organisations at regional level especially in developing countries and countries with economies in transition, through delivery of appropriate water quality assessments, training and capacity building initiatives that address their needs at that level.

33. Programmatic synergies between the GEMS/Water Programme and other UN Agencies, e.g. World Meteorological Organization (WMO), World Health Organisation (WHO), UNESCO International Hydrology Programme (UNESCO/IHP) can be enhanced e.g. through regular UN-Water Group meetings.

34. Similarly, internal cooperation between GEMS/Water and other UNEP water-related programmes, e.g. The Global Plan of Action for the Protection of the Marine Environment from Land-based Activities (GPA) or UNEP Regional Offices should be noticeable and explored for appropriate activities.

35. UNEP-Live (www.unep.org/uneplive) in its function as a knowledge management platform designed to bring together relevant but widely dispersed archived and current information for policy-making will enable the use of global services combined with regional, national and local data to identify key emerging environmental issues and support integrated assessments and policy analysis on the state of global, regional and local environments. The principles used for UNEP Live include open access and the sharing of data once for multiple uses.

Improving the availability of data

36. To deal with the problem of data coverage and gaps there is opportunity for involvement in regular and comprehensive global overviews of the water quality status. Therefore a variety of parameters, geographic coverage and inclusion of many types of water bodies in the study will be needed leading to determination and prioritisation efforts in data collection and networking. Promotion of data collection from basin-level projects and activities initiated at the regional level and supported by the programme at the global level to beef up submissions in the GEMStat database.

37. The updating and added developments in the GEMStat database provides an opportunity to provide more assistance and web based tools to users on data analysis and interpretation of their results, especially in support of policy decision making;

38. Providing of a countries open access to QA/QC checked Water Quality on the UNEP Live platform, will encourage interaction between users and data providers. This could lead to a wide range of uses for academia, business and policy development and enactment.

Strengthening capacity building in developing countries

39. Capacity building activities have depended on resource persons from Environment Canada. Building on this solid foundation, the current and future change provide ample opportunity to re-design, regionalise and adopt modern tools in capacity building approach for the Programme according to programmatic focus, priorities and financial feasibility.

Participating in regular Water quality assessments

40. The Post-2015 UN Development Agenda provides a great opportunity to demonstrate the value of GEMS/Water and the significant role it can play in supporting the process with its WQ data. With these data, the programme should participate in and provide guidance in periodic global and regional water quality assessments, which include a review of the state and trend of the water quality and production of reports and real time country/regional level findings posted on the UNEP Live platform.

E. Reforming GEMS/Water Programme

41. This is an opportunity for a detailed reformation of the Programme as presented in the report entitled, *The proposed Structure and Business Model for GEMS/Water*, whose highlights are as follows:

42. **Regional Hubs**: to be created through collaboration with regional and national centres of excellence with similar interests in water quality i.e. as Communities of Practice and the involvement of UNEPs regional offices. Their proposed roles and functions are given in the annex. For a first example under development see paragraph 43.

43. **GEMStat database**: will be hosted by the German Federal Institute for Hydrology (FIH or Bundesanstalt für Gewässerkunde (BAfG), under an Agreement between UNEP and the German

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB, acronym in German). The FIH is tasked with this responsibility by BMUB

44. **The capacity building component** under leadership with and coordination by the partners in Ireland will be redesigned. This will be carried out in collaboration with technical partners, regional hubs and UNEP regional offices. Some countries that could be potential capacity building hubs are Israel, South Korea, China, Japan, South Africa etc. Brazil through its National Water Agency (ANA) is in the process of finalizing a Memorandum of Understanding (MoU) with UNEP for a regional hub which will likely have a focus on capacity building.

45. **The Laboratory Performance Evaluation (PE) Studies** will continue as a demand driven service at a minimal cost in collaboration with Ireland, the German Federal Institute for Hydrology (FIH) and selected institutes either governmental or private in nature with expertise in PE studies and UNEP GEMS/Water Programme.

46. **The Global Programme Coordination Unit (GPCU)** will provide a strong global leadership, by strengthening the team at UNEP Headquarters to coordinate and manage the Programme.

IV. GEMS/Water Global Data Centre - GEMStat

47. After 35 years of successful operation of the GEMS/Water Global Data Centre including the global water quality database GEMStat in Canada, the Government of Germany supports the operation of GEMStat as of April 1st, 2014.

A. Organization

48. The GEMS/Water Global Data Centre, funded by the German Federal Ministry for Environment, Reactor Safety and Construction is facilitated by the German Federal Institute of Hydrology and the German Internal Hydrology Programme – of UNESCO and Hydrological Water Resource Programme - of WHO (IHP/HWRP) Secretariat and operates under the auspices of the UNEP GEMS/Water Global Coordination Unit.

49. In the course of 2014, the full operational state of the data centre will be established gradually subsequent to migrating the GEMStat database and information system and hiring staff. From 2015 onwards, five full-time employees are being planned to support the operation of the data centre.

B. Content

50. The GEMS/Water Global Data Centre has the following main functions:

(a) Collect water quality monitoring data from national partners and collaborating organizations in GEMStat and enhance its accessibility and interoperability;

(b) Control and assure data quality within the database and support partners on samplings, analysis and QA/QC methods;

(c) Contribute to water quality assessments and guidelines for environmental water quality;

(d) Develop reports and data products to improve the knowledge on global water quality issues;

(e) Enhance the capabilities to monitor post-2015 development with regards to water quality and targets;

C. Technical

51. The existing GEMStat database and information system is currently being migrated and updated maintaining the current functionality and developing/enhancing the user experience and interoperability with existing global information system such as UNEP Live and GEOSS.

52. The focus of the technical development is on implementing and promoting open data exchange formats and web services to foster free access and to improve collaboration.

D. Regional implementation

53. Regionalisation will increase visibility and help GEMS Water to have better operational activities in the future by responding more effectively to country needs in capacity building and technical support. This strategy will lead to the creation of regional hubs in institutions that have a leadership on water quality monitoring and assessment.

V. Programme support functions and structures

54. Through the transition into a new business and governance model, the GEMS/Water programme will build partnerships with the world water community and institutions interested and engaged in capacity building by increasing participation of developing countries in water quality monitoring, assessment, research and reporting, developing training courses and promoting partnerships to deliver via regional centres of excellence, making data accessible on UNEP Live and building constituencies for continued data flows.

A. Partnerships and the new GEMS/Water Network

55. Partnerships and networking are essential to the Programme's success and sustainability. To provide direct support to the implementation of the work programme at the global level, strategic partnerships are being established with the Governments of Germany and Ireland particularly on the management of GEMStat and capacity building activities, respectively.

56. At the regional level, GEMS/Water is actively seeking to develop new partnerships with governmental and non-governmental institutions having relevant technical and training profiles and common mandate in water quality to serve as regional hubs for capacity building. Regionalisation will help GEMS/Water to have a better operation in the future by responding more effectively to country needs in capacity building and technical support. This strategy will lead to the creation of regional hubs in institutions that have a leadership on water quality monitoring and assessment. The support of technically skilled personnel through a comprehensive partnership network is essential for GEMS/Water in the future.

57. This approach will evolve through the advice of the Steering Committee. To date, the Government of Brazil (through ANA) has expressed its firm interest in becoming a regional hub for Latin America and the Caribbean as well as supporting the capacity building activities for Portuguese-speaking countries in Africa. A related MoU is in its final stages. In addition to developing partnerships for direct support, the Programme will also examine where programmatic synergies and complementarity can be found through partnerships within and outside the UN system in order to optimise the resources and maximise the programmatic impacts to reach the common mandate on water. At the global level, GEMS Water should be closely affiliated with UN Water Group, UNESCO and the WMO.

58. The existing GEMS/Water network of NFPs are formally designated by countries as entities responsible for the sharing of water quality data and information with GEMStat as well as coordinating with the Programme on capacity building needs and activities. The programme also reaches out to other data sources by working with a network of CFPs from academia, research institutions and other organisations such as river and lake commissions. Efforts have been made over the past two years to revitalise, build and strengthen the networks through formal letters to the appropriate government ministries dealing with water quality in each country. Four workshops have been organised in liaison with regional Offices, ensuring a more engaging, building and strengthening of the networks. Forty countries were involved in this network strengthening process. Currently there are 83 NFPs and 18 active CFPS. This process has to continue with a closer involvement of UNEP's regional Offices to re-confirm, or indicate new designation of NFPs. The Data Working Group will provide advice on identifying and engaging other key institutions to partner with for data collection and sharing.

Regional Network Hubs

59. Regional hubs will promote broad-based collaboration and building Communities of Practice with partner institutions that have similar interests in water quality management and will contribute to the implementation of GEMS/Water activities. As opposed to depending on a single institution for all WQ activities in all locations as in the past, the decentralised approach through regional hubs will increase efficiency in delivery of services response to specific needs of countries. The model will also enhance international cooperation (north-south and south-south), and partnerships with governments, universities, centres of excellence, and individual experts – both donors and recipients of assistance. Focus of assistance will be mainly to developing countries and countries with economies in transition. The detailed draft criterion for a hub, (see annex) with roles and functions has been developed and may receive further input from other potential hubs.

60. In principle the role and responsibilities of a hub includes:- close collaboration with the GPCU; carrying out or participation in WQ assessments; carrying out regional/national training in water quality monitoring and analyses; participating in the development and application of GEMS/Water capacity building tools; encouraging and spearheading submission of country level WQ data to the

UNEP Live Platform; and contributing to the Programme's fundraising efforts by carrying out resource mobilisation at the regional level; and organising WQ outreach activities, among others. UNEPs regional Offices will closely follow up on activities of regional hubs and will assist the GPCU in coordination of activities at this level.

Member countries network

61. National Focal Points: In the past, data submissions have been through formal agreements between GEMS/Water and each national WQ authority submitting data and information through the designated NFP on a variety of parameters, on a yearly (or one time per year) basis. This practise will need to be reworked through discussions with the GEMS/Water Programme, and the new host of the GEMStat. In addition, modalities for making data available on the open access system of UNEP Live will be worked out with the GEMS/Water Programme.

Collaborating Centres Network

62. In addition to data provided by national authorities, GEMS/Water also welcomes data and information provided by other institutions and monitoring programmes that regularly monitor water quality through a Collaborating Focal Point (CFP), e.g. universities, research organisations, river and lake commissions, intergovernmental organisations, non-governmental organisations, etc. Currently GEMS/Water has a network of institutions contributing data to the Programme, e.g. Mekong River Commission, etc. Opportunities for use of their data on the UNEP Live open access system will have to be developed.

B. Capacity-building

63. Building and strengthening institutional and human capacity of countries to collect, generate, analyse and share freshwater quality data and indicators remain a priority for GEMS/Water. Communicated through the GEMS/Water networks, the requests from countries for capacity development cover a variety of subjects ranging from, for instance, technical capacity to conduct laboratory analyses, or capacity to design a national water monitoring programme and select meaningful indicators, to institutional capacity to use scientific data for assessment, providing information for water policies and regulations. Such diverse demands require a comprehensive approach to effectively tackle the challenges from technical and technological aspects through stronger and broader collaborations with existing and new networks of partners, centres of excellences as well as Communities of Practice.

64. The capacity building in water quality monitoring is important not only in the GEMS/Water context, but also necessary in the implementation of other global processes, e.g. the Bali Strategic Plan for Technology Support and Capacity Building, the Post-2015 Development Agenda and SDGs relating to water, as well as global and regional MEAs. According to the 2013 report from the Working Group on Monitoring and Indicators of the UN system task team on the Post-2015 UN Development Agenda, capacity and potential capacity of countries for data collection, analysis and reporting are perquisite to the development and monitoring of new indicators and targets. It also stresses the importance in investing in building capacities at both national and international levels.

65. The GEMS/Water capacity building has been reconfigured to better respond to the diverse capacity needs taking into account the necessary engagement of new and potential partners and stakeholders; the need for a more robust delivery and stronger ownership of the programme at national and regional levels; and the opportunity to actively contribute to broader initiatives. Under the partnership agreements currently being developed between Ireland and UNEP, a new GEMS/Water Centre for Capacity Building is foreseen to lead the capacity building activities with support from a consortium of Irish universities and institutions. It will partner with the FIH in Germany as co-hosts of the new GEMS/Water Programme. It will be designed to deliver the work at national regional and global levels in close coordination with GPCU and a network of regional hubs. The new Centre is likely to be at University College Cork (UCC), under the umbrella of its Centre for Global Development, acting on behalf of the Irish Department of Environment, Community and Local Government (DECLG) and Department of Foreign Affairs and Trade (Irish Aid).

66. As described in Section V above, the new configuration of regional hubs will be instrumental in the national and regional implementation of GEMS/Water. A regional hub will be asked to act as a regional (or sub-regional) champion in order to facilitate and support the implementation of GEMS/Water programme on a regional (or sub-regional) scale including capacity building activities. The regional hubs serve as a direct mechanism to deliver the capacity building and training more effectively and efficiently at the regional level, in conjunction with the new GEMS/Water Centre for Capacity Building. As a bottom-up approach, the regional hubs play a key role in identifying and conveying national and regional capacity needs and priorities to the global programme.

67. In general terms, a range of capacity building activities that would be offered by the GEMS/Water Centre for Capacity Building include, for example,

(a) Design of appropriate, or tailor-made, monitoring programmes to meet specific objectives for both surface and groundwater;

(b) Technical training on sampling and analytical techniques for water quality monitoring;

(c) Training on the basics of quality assurance in monitoring programmes;

(d) Training in water quality assessment principles and approaches using national monitoring data and production of State of the Environment reports;

(e) Development of new tools and methods for water quality monitoring and assessment in relation to national needs, e.g. tailored water quality indices, biological monitoring methods, real-time monitoring, sensor development and deployment;

(f) Training of third-level teachers on monitoring method development, programme design, current approaches to water quality assessment and integrated water resources management;

(g) Training in environmental monitoring and technology-supported solutions to water quality management;

(h) Training on utility of and access to UNEP Live and its features.

68. Given a breadth of capacity issues to address and limited resources available, the Programme will also take advice from the Working Group on Capacity Building which will consider such matters as,

(a) Common demands for capacity building at global and regional levels in relation to existing capacities;

(b) Priority needs in relation to the SDGs and other key processes;

(c) Specific capacity needs to help improve the data gaps and geographical coverage;

(d) The versatility of existing capacity building tools and materials to meet the needs; and,

(e) The Programme's capacity to timely respond to countries' requests.

C. Technology support

69. Technology has a crucial role to play in the water quality monitoring. Through the consortium of Irish institutions and hubs, GEMS/Water will have the opportunity to work with a large number of universities and research institutes, including particularly those specialised in modern technologies in water monitoring and remote sensing. Emerging sensor technologies have the capability to provide real-time information on variability of pollutants present and concentrations, as well as early detection of extraordinary events. Presently the water quality information is often obtained from discrete samples and analysis of a few parameters with inconsistent frequency for some parameters both temporally and spatially. This leaves a gap that can be filled by innovative technologies such as in-situ sensors where continuous high-frequency data can be accessed on-site or remotely. To the extent possible, GEMS/Water aims at promoting the accessibility to and application of innovative and affordable technologies to enhance the capacity of developing countries to apply and benefit from the new innovations. This will also provide countries with an opportunity to be involved in the technological research and development.

VI. Conclusion

70. During the transition phase, links/synergies between GEMS/Water and water assessment activities will be strengthened and operationalized (if not yet the case). Links to activities aiming to guide indicator and normative processes such as the international water quality guidelines for ecosystems (IWQGES) will be worked out. GEMS may play a critical role as a nucleus supporting the different initiatives in the broad aspect of water quality monitoring and ensuring quality and scientific rigor to enable evidence based decision making. This is seen as a key contribution to the Post 2015 development agenda. The plans to address data gaps on water quality as well as ways and means to collect data from both technical and political contexts will be worked out in more details. The GEMS/Water programme will address the national capacity building and promote country buy-in with regard to data accessibility and collection (including the different ways and means of technological development). It will build a strategy to monitor and support the water quality and waste water related aspects in SDG targets and will liaise with appropriate partners and organisations in the field of data

management. Here GEMS/Water is well positioned to improve global coverage and consistency of water quality related data and to make use of the technical, educational and scientific opportunities. Pathways for the future will be for GEMS/Water to support and customise capacity development efforts, improve freshwater monitoring systems and exchange technology that can support national, regional and global assessments namely also in contribution to the regional and global implementation of UNEP's Global Environmental Outlook (GEO) process.

Annex

Draft terms of reference: GEMS Water/ regional hubs

Mission

Supporting the regional implementation of GEMS Water towards coherent regional water quality/quantity monitoring and enabling multi scale assessments and decision support

Rational

1. As opposed to depending on a single institution for all WQ activities in all locations as in the past, the decentralised approach through Regional Hubs is aimed to increase efficiency in the delivery of services in response to specific needs of countries/regions. The model will also enhance international cooperation namely north-south and south-south exchange and capacity building, partnerships with governments -both donors and recipients of assistance, universities, centres of excellence, and individual experts and decision makers. Focus of assistance will be mainly to developing countries and countries with economies in transition.

2. In restructured GEMS Water – Regional Hubs will be created through collaboration with regional and national centres of excellence and Communities of Practice with similar interests and appropriate capacity in water quality monitoring, networking, and capacity building. Regional Hubs will work in collaboration with and be supported by UNEP's Regional Offices (*not only ROs, also central coordination unit*). Criteria and their proposed roles and functions in generic terms are given below. It is expected that roles and functions as well as priorities will reflect the specifics of regional needs.

Operation

3. Regional Hubs will promote broad-based collaboration with partner institutions engaged in water quality/quantity data and management and will contribute to the implementation of GEMS/Water activities on a regional scale. In general the role and responsibilities of a hub should include:

(a) Close collaboration with the GPCU, GEMStat, the capacity building centre, and data networking, including UNEP Live;

(b) Encouraging and spearheading accessibility and submission of country/regional level WQ data and working with the UNEP Live Platform, by building national and regional networks and engaging with Communities of Practice engaged in country and regional assessments;

(c) Supporting or carrying out (participating in) WQ assessments;

(d) participating in the development and application of GEMS/Water capacity building tools including to carry out regional/national training in water quality monitoring and analyses (*refer to guidance of capacity building WG*);

(e) Contributing to the Programme's fundraising efforts by carrying out resource mobilisation at the regional level; and organising WQ outreach activities. (UNEP's Regional Offices will closely follow up on activities of regional hubs and will assist the GPCU in coordination of activities at this level);

(f) Engaging in South–South dialogue and exchange as to build capacity across Regional Hubs.

Proposed criteria for a country/institution to qualify as a Regional Hub, i.e. a champion for the GEMS/Water implementation on regional scale

A country/institution that is able and willing to act as a regional/sub-regional champion and having most of the following criteria could be considered as a hub:

1. Having a critical mass of highly trained experts in water quality compared to other countries in the region/sub-region.

2. Being active in research in water quality/quantity related issues and provides or has access to well-equipped laboratory facilities with qualified man power and expertise.

3. Facilitating (or being actively involved in) regular water quality sampling, analysis and monitoring activities along harmonized QA data standards (*access to available monitoring data as well as promoting data sharing*).

4. Providing an own network of regional partners and ability to set regional priorities in the wider frame and mandate of GEMS/Water (*combine: Ability to promote and maintain relevant networks e.g. with UN partners and beyond such as Water Basin Authorities) (consider: regional/sub-regional drivers, SDG's context, interest/benefits for countries, etc.).*

5. Leading or facilitating regional capacity building trainings and WQ assessment projects in collaboration with the UNEP GEMS/Water Programme.

6. Ability to host a secretariat for regional GEMS Water.

7. Able to assist and partner with NFPs in the region to use/disseminate statistical tools/GEMStat and mobilize data flows.

8. Willingness as well as ensured financial contribution to work closely with UNEP Regional Offices and UNEP Live to foster and take responsibility for regular water quality/quantity status (and trend) reporting across various systems and scales.